40. Fluid flow contouring apparatus according to claim 39 wherein said heat transfer conduits comprise an array of cylindrical heat transfer conduits oriented to have parallel axes.

41. Fluid flow contouring apparatus according to claim 40 wherein each said baffle structure comprises a sleeve-shaped element which is substantially concentric relative to the associated heat transfer conduit.

42. Fluid flow contouring apparatus according to claim 41 wherein said paired sets of fluid flow apertures comprise upstream and downstream apertures in said sleeve-shaped elements.

43. Fluid flow contouring apparatus according to claim 39 wherein at least two of said baffle structures are interconnected into a larger flow contouring apparatus for contouring fluid flow around a plurality of heat transfer conduits.

44. Fluid flow contouring apparatus according to claim 40 wherein said heat transfer conduits are arranged in a generally circular array.

45. Fluid flow contouring apparatus according to claim 44 wherein the individual baffle structures associated with the heat transfer conduits are interconnected to form a larger, cylindrical-shaped flow contouring apparatus.

46. Fluid flow contouring apparatus according to claim 45 wherein pairs of fluid flow apertures comprise radially-aligned upstream and downstream apertures in the individual baffle structures.

47. Fluid flow contouring apparatus according to claim 45 wherein pairs of fluid flow apertures comprise upstream and downstream apertures in the individual baffle structures which are offset from the radial line.

48. Fluid flow contouring apparatus according to claim 39 wherein said heat transfer conduits comprise at least one generally circular array of axially aligned cylindrical heat transfer conduits, at least some of which are substantially surrounded by a substantially concentric apertured sleeve-shaped structure having upstream and downstream aperture pairs in columns parallel to the axis of the associated conduit, further wherein a sleeve-shaped structure is secured by a plate member to an adjacent sleeve-shaped structure to form a larger cylindrical structure.

49. Fluid flow contouring apparatus according to claim 48 wherein the aperture pairs comprise elongated slots, each slot having a long axis generally parallel to the axes of the heat transfer conduits.

50. Fluid flow contouring apparatus according to claim 49 wherein pairs of elongated slots are in radial alignment.

51. Fluid flow contouring apparatus according to claim 49 wherein a heat transfer conduit is associated with two pairs of elongated slots, each slot pair being offset from radial alignment with the axis of the larger cylindrical structure.

52. Fluid flow contouring apparatus according to claim 51 wherein the two upstream and the two downstream elongated slots associated with each heat transfer conduit are axially offset from one another but axially aligned with the opposite pair member.

53. Fluid flow contouring apparatus according to claim 48 wherein said heat transfer conduits comprise at least two generally circular arrays of cylindrical heat transfer conduits oriented to have parallel axes, one array being concentric relative to the other.

54. Fluid flow contouring apparatus according to claim 53 wherein the aperture pairs comprise elongated slots in radial alignment, each slot having a long axis generally parallel to the axes of the heat transfer conduits.

55. Fluid flow contouring apparatus according to claim 53 wherein the baffle structures of adjacent pairs of radially-aligned heat transfer conduits are interconnected such that an aperture between the baffle structures serves as the downstream fluid flow aperture for one of the conduits and the upstream fluid flow aperture for the other.

56. Fluid flow contouring apparatus according to claim 55 wherein the aperture pairs comprise elongated slots in radial alignment, each slot having a long axis generally parallel to the axes of the heat transfer conduits.

57. Fluid flow contouring apparatus according to claim 39 wherein said heat transfer conduits comprise a substantially rectangular array comprising at least three axially aligned rows of cylindrical heat transfer conduits oriented to have parallel axes, and wherein the associated baffle structures comprise generally concentric sleeve-shaped elements having upstream and downstream aperture pairs.

58. Fluid flow contouring apparatus according to claim 39 wherein said heat transfer conduits comprise a substantially rectangular array comprising at least three rows of cylindrical heat transfer conduits, with alternate rows being axially offset from adjacent upstream and downstream rows, the heat transfer conduits oriented to have parallel axes, and wherein the associated baffle structures comprise generally concentric sleeve-shaped elements having upstream and downstream aperture pairs.

59. Fluid flow contouring apparatus according to claim 39 wherein the baffle structure associated with a heat transfer conduit comprises a set of substantially flat plate members positioned in pairs edgewise alongside two sides of a heat transfer surface in proximity to without touching the surface, the planes of said plate members being oriented generally orthogonal to the fluid path of the process fluid, so as to define generally annular-shaped fluid flow regions having upstream and downstream aperture pairs around said heat transfer conduits.

60. Fluid flow contouring apparatus according to claim 39 wherein the baffle structure associated with a heat transfer conduit comprises contoured plate members positioned in pairs alongside two sides of the heat transfer conduit in proximity to without

touching the surface of the conduit, said plate members having a contour corresponding respectively to the two sides of the heat transfer conduit so as to define generally annular-shaped fluid flow regions having upstream and downstream openings around said heat transfer conduits, said plate members being joined to other plate members associated with adjacent heat transfer conduits.

61. A method for enhancing heat transfer to or from a fluid flowing cross-wise in contact with the outer surfaces of a plurality of heat exchange conduits comprising the step of preferentially contouring cross-wise fluid flow across the heat exchange conduits by flowing the fluid through at least a paired set of fluid flow constrictors in a longitudinally continuous, sleeve-shaped baffle structure associated with a heat exchange conduit, said baffle structure being part of an array of such baffle structures, each of which substantially symmetrically surrounds its associated heat exchange conduit to isolate cross-wise fluid flow around that associated heat exchange conduit from cross-wise fluid flow around adjacent heat exchange conduits located transversely to the direction of fluid flow, wherein the fluid flow constrictors of each baffle structure constitute the only upstream-to-downstream fluid passage through the baffle structure array and are symmetrically located respectively upstream and downstream of the associated heat exchange surface in at least partial upstream and downstream alignment with each other and with the associated heat exchange conduit, and whereby each baffle structure contours the flow path of said fluid to establish a substantially uniform fluid flow pattern around the contour of the associated heat exchange conduit.

62. A method according to claim 61 wherein said heat exchange conduits comprise an array of cylindrical heat exchange conduits oriented to have parallel axes.

63. A method according to claim 62 wherein each said baffle structure comprises a sleeve-shaped element which is substantially concentric relative to the associated heat exchange conduit.

64. A method according to claim 63 wherein said paired sets of fluid flow constrictors comprise upstream and downstream apertures in said sleeve-shaped elements.

65. A method according to claim 61 wherein at least two of said baffle structures are interconnected into a larger flow contouring apparatus for contouring fluid flow around a plurality of heat exchange conduits.

66. A method according to claim 63 wherein said heat exchange conduits are arranged in a generally circular array.

67. A method according to claim 66 wherein the individual baffle structures associated with the heat exchange conduits are interconnected to form a larger, cylindrical-shaped flow contouring apparatus.

68. A method according to claim 67 wherein pairs of fluid flow constrictors comprise radially-aligned upstream and downstream apertures in the individual baffle structures.

69. A method according to claim 67 wherein pairs of fluid flow constrictors comprise upstream and downstream apertures in the individual baffle structures which are offset from the radial line.

70. A method according to claim 61 wherein said heat exchange conduits comprise at least one generally circular array of axially aligned cylindrical heat exchange conduits, at least some of which are substantially surrounded by a substantially concentric apertured sleeve-shaped structure having upstream and downstream aperture pairs in columns parallel to the axis of the associated conduit, further wherein a sleeve-shaped structure is secured by a plate member to an adjacent sleeve-shaped structure to form a larger cylindrical structure.

71. A method according to claim 70 wherein the aperture pairs comprise elongated slots, each slot having a long axis generally parallel to the axes of the heat exchange conduits.

72. A method according to claim 71 wherein pairs of elongated slots are in radial alignment.

73. A method according to claim 71 wherein a heat exchange conduit is associated with two pairs of elongated slots, each slot pair being offset from radial alignment with the axis of the larger cylindrical structure.

74. A method according to claim 73 wherein the two upstream and the two downstream elongated slots associated with each heat exchange conduit are axially offset from one another but axially aligned with the opposite pair member.

75. A method according to claim 70 wherein said heat exchange conduits comprise at least two generally circular arrays of cylindrical heat exchange conduits oriented to have parallel axes, one array being concentric relative to the other.

76. A method according to claim 75 wherein the aperture pairs comprise elongated slots in radial alignment, each slot having a long axis generally parallel to the axes of the heat exchange conduits.

77. A method according to claim 75 wherein the baffle structures of adjacent pairs of radially-aligned heat exchange conduits are interconnected such that an aperture between the baffle structures serves as the downstream fluid flow constrictor for one of the conduits and the upstream fluid flow constrictor for the other.

78. A method according to claim 77 wherein the aperture pairs comprise elongated slots in radial alignment, each slot having a long axis generally parallel to the axes of the heat exchange conduits.

79. A method according to claim 61 wherein said heat exchange conduits comprise a substantially rectangular array comprising at least three axially aligned rows of cylindrical heat exchange conduits oriented to have parallel axes, and wherein the associated baffle structures comprise generally concentric sleeve-shaped elements having upstream and downstream aperture pairs.

80. A method according to claim 62 wherein said heat exchange conduits comprise a substantially rectangular array comprising at least three rows of cylindrical heat

exchange conduits, with alternate rows being axially offset from adjacent upstream and downstream rows, the heat exchange conduits oriented to have parallel axes, and wherein the associated baffle structures comprise generally concentric sleeve-shaped elements having upstream and downstream aperture pairs.

81. A method according to claim 61 wherein the baffle structure associated with a heat exchange conduit comprises a set of substantially flat plate members positioned in pairs edgewise alongside two sides of a heat exchange conduit in proximity to without touching the surface, the planes of said plate members being oriented generally orthogonal to the fluid path of the process fluid, so as to define generally annular-shaped fluid flow regions having upstream and downstream aperture pairs around said heat exchange conduits.

82. A method according to claim 61 wherein the baffle structure associated with a heat exchange conduit comprises contoured plate members positioned in pairs alongside two sides of the heat exchange conduit in proximity to without touching the surface, said plate members having a contour corresponding respectively to the two sides of the heat exchange conduit so as to define generally annular-shaped fluid flow regions having upstream and downstream openings around said heat exchange conduits, said plate members being joined to other plate members associated with adjacent heat exchange conduits.

Remarks

In general, the purpose of this Preliminary Amendment is to amend the pending claims to better conform with amended claims 1 – 44 submitted by an Article 34 Amendment during Chap. II proceedings in the PCT application on which this Sec. 371 application is